GAS JOURNAL, JUNE 5, 1940

VOL. 230 92nd YEAR No. 4020

EDITORIAL NOTES

SULPHUR REMOVAL

RECENT happenings in the Netherlands must have given rise to thoughts of their possible repercussions on gas-works practice in our own country. We refer particularly, of course, to the removal of sulphuretted hydrogen from gas by the oxide purification process, for Holland was the source of supply of a considerable quantity of natural oxide employed for the purpose. Not that we regard the drying-up of this source as being a matter of immediate grave concern to the Gas Industry, but it is one which may become more serious as time passes unless gas engineers give their attention to the most efficient use of the material at present available and to possible alternatives to natural oxides for gas purification. Fortunately, since the last War a very great deal of investigation and experiment has been conducted both into making the best use of oxide purification plants and into alternative methods of ridding gas of sulphuretted hydrogen; and this work, we are sure, is going to stand the Industry in good stead and relieve apprehensions as to the future. Necessarily, available knowledge will have to be reviewed and studied—and no doubt it is being studied closely in responsible quarters—and possible developments and action clearly envisaged.

We have mentioned the large amount of work which has been carried out on the subject since the last War—investigations undertaken in this country and in other countries. Only recently ("JOURNAL" of Jan. 24 of this year) the experiences of the Commercial Gas Company with burnt oxide were recounted. This Company has for many years used this material almost exclusively for sulphuretted hydrogen removal with "reasonably satisfactorily results." A year previously ("JOURNAL" of March 15 and 22, 1939) we recorded an important symposium of several chemical and engineering societies held in Manchester when sulphur removal processes of both dry and liquid types were dealt with. Continuously, the "JOURNAL" has followed developments in technique and in new processes in this, as in every other, direction, and its pages indicate to what an extent the Industry in present circumstances can draw upon past research, experiment, and practice. Conditions of to-day bring sharp definition to two aspects of the purification problem—(a) purification with minimum expenditure on iron oxide, when the recovery of sulphur is not a major consideration; and (b) purification by methods in which recovery of sulphur as such assumes great importance. In wartime both aspects are of more than ordinary interest.

Without going into any detail regarding liquid purification methods which may be classified under group (a), we may recall the work carried out at Southport fifteen years ago ("JOURNAL" of Nov. 18, 1925). Even at that time the gas-works there had deficient oxide purifying area and capacity, and recourse was had to the circulation of a dilute solution of soda ash through a tower scrubber, to absorb sulphuretted hydrogen, hydrocyanic acid, and other sulphur compounds. The foul liquor was pumped through a second scrubber, through which large volumes of air were blown. By this simple operation the solution was revivified. In that case the foul gases were led through a heap of oxide placed in an open purifier, and it was found possible to foul the material up to 55% sulphur without difficulty. Oxide purifiers were employed to remove from the town gas the sulphuretted hydrogen not absorbed in the liquid process.

In regard to group (b), there is as an example the Thylox process, in which sulphur is produced in three forms, and there are the various processes based on ammonia washing which, as far as the Gas Industry is concerned, would appear to be best adapted to a partial removal of sulphuretted hydrogen, leaving final purification to existing oxide boxes. And there are other methods of sulphur recovery based on higher working temperatures and catalysis. Moreover, should maximum sulphur recovery from gas be deemed necessary under wartime conditions, the field should be viewed to include also coke oven gas used for heating the ovens and for steel heating furnaces, in which respect partial recovery by processes other than oxide purification would be attractive.

For economic and other reasons, such as technical supervision of plant and so on, and especially because of the necessity of removing all the sulphuretted hydrogen from gas supplied to the district, liquid processes have not replaced in the Gas Industry the well-tried dry purification method by oxide. The purpose of this note, however, is not to discuss the economic aspect of purification so much as to indicate the good fortune of the Industry to be able at a period such as this to draw upon the results of prolonged research and practical application. It should not prove difficult to find an answer to possible future purification problems if and when they arise.

S.B.G.I.

IT is a matter of common knowledge that during recent years not only has what may be termed the internal strength of the Society of British Gas Industries been greatly increased but also its organization for dealing rapidly and effectively with external affairs. It was indeed fortunate for the Gas Industry that this consolidation of interests and confident outlook had been established on firm foundations before the outbreak of war. September last was obviously a testing ground for the Society; its unity, flexibility, and adaptability to changed and ever-changing conditions have proved more than equal to the severe test. That this is so can be discerned in part from the Annual Report of Council for 1939-40 which we publish in the "JOURNAL" to-day. The report was to have been presented at the Annual Meeting of the Society which was to have taken place to-day in London. In view of the international situation, however, and in common with the decisions of The Institution of Gas Engineers and the National Gas Council in regard to their meetings, the Society rightly decided upon its postponement.

With problems of a constantly changing character to be faced and elucidated, the complexion of the Society's activities has inevitably altered. Pre-war, the work was centred largely on internal organization and co-operation with the other national bodies speaking for the Gas Industry—the N.G.C., the I.G.E., the B.C.G.A. On the outbreak of war a state of affairs, the result of "internal rationing," was imposed which called for keen thought and vigorous action. The alternative was stagnation and possible disintegration. Into this alternative there was no drift. Time was taken by the forelock and speedily the Society found itself, unanimous in voice and determination, capable of grappling successfully with entirely new "outside" problems the while without interfering with internal arrangements. Since Sept. 3, 1939, the Society has, in its dealings in many matters with the responsible Govern-

ment departments, shown a sharp decision and a clear-cut line of action which cannot have done other than impress in authoritative quarters the fact the Gas Industry is virile, and alive to its potentialities of service in times of national crisis. At any rate as far as the S.B.G.I. is concerned, the importance of the time factor was fully realized; and thanks to the spirit of co-operation of the members comprising the Society, the switch-over from peacetime activity to wartime effort was effected with a minimum of delay. The confidence exhibited by members has been justified and rewarded in the outcome; the solidarity demonstrated will have an important bearing in the months to come. In the words of the report: "Nothing approaching a static position is likely to be reached in the affairs of the Industry so long as the emergency lasts." Securely organized, as it now is, we feel sure that the Society will be capable of dealing well with problems as they arise, as arise they will.

Appropriate to the times, the S.B.G.I. Report is brief, and reference to many of its activities in the year under review has perforce been omitted. Since the war the Society has spoken with authority and knowledge on behalf of its members and has undoubtedly linked together the more closely the various and varied interests involved. The needs of members for raw material for production have, of course, had first consideration, and it has been made obvious to Government departments that the Industry is capable of rendering great assistance directly and indirectly in the war effort. No good purpose can be served here at the moment in entering into detail about the many activities of the Society undertaken in the period to which the report relates. Two specific activities may, however, call for mention—"starlight" lighting in the interests of public safety and amenity, and the recent work in connexion with the Export Council. Members of the Society really got together on the question of providing standard wartime street lighting units. The position is now being watched closely, and it may be remarked that week by week the Ministry of Security is being furnished with statistical returns from the Gas Industry. As for co-operation with the Export Council, this is very recent history. It was the subject of comment in our issue of May 8, and the speed with which unusual complications were smoothed out speaks volumes for the sound organization of the S.B.G.I. The work was accomplished, it should be emphasized, without interference with internal arrangements; and the ready response which has been accorded to it is yet another indication of that spirit of confidence and trust which pervades the Society. Returns for steel requirements for export of the various firms are already in the hands of the Board of Trade; over sixty firms are concerned, and 90% are members of the S.B.G.I.

In the times through which we are striving it is recognized by members of the Society that action must be taken at once and that drawn-out consultation is precluded. Decisions have to be arrived at under pressure of the clock. National interest is above all other considerations. This is the spirit which animates the Society's work to-day, and its effectiveness is a measure of the loyalty and co-operation of its individual members.

GAS IN INDUSTRY

THE use of gas for industrial heating processes of all types grows apace as its merits become more generally appreciated; month by month new applications are found in an ever-widening field; gaseous heat is playing a vital part in the present war effort. In our issue to-day we publish several items dealing with developments in the use of gas in the industrial sphere—notes which give a glimpse of the variety of the field and its enormous possibilities. One of the articles is concerned with the manufacture of shoes, in which industry gas is employed extensively, and at all stages in the make-up of the shoe, because of its nicety of heat control, its cleanliness, and its remarkable convenience and flexibility.

We have had occasion to refer previously in our columns to the application in the United States of inert gases in many processes. In some installations engine exhaust gases are utilized, after being purified, for maintaining neutral atmospheres in heat treating furnaces, over varnish pots, and so on. In other installations inert gas generators specially designed are employed. This method is now being used with very satisfactory results in three of the largest paint and varnish works in the States. The inert gas is delivered at low cost and in large volume for "blowing" synthetic varnishes during manufacture, for excluding air from heated batches of varnish or oil, for eliminating skinning in paint storage, and for preventing the accumulation of gummy layers of oxidized paints and varnishes. Gas conditioning units of the type form the subject of an article on later pages, which shows that we are not lagging behind in this country in our interpretation into practice of new ideas. The principle of operation of the plant is outlined and its advantages are summarized, the saving in operating costs compared with former systems being emphasized.

Another item refers to the use of gas in poultry breeding—a matter obviously of major importance at the present time—and the way in which this service can be effectively publicized at negligible cost; while a further article deals with gas service for the modern army. In the particular installation described an annual consumption of over 150 million cu.ft. is involved. It is one of the largest contracts of its kind ever placed by the War Office in connexion with the power, heating, water heating, and cooking requirements of an extensive military establishment—and the contract, be it noted, is for a period of 21 years. There is another important aspect of this contract. The military depôt is situated some miles from the nearest town, and the affording of gas supply has necessarily meant considerable extensions of mains, which will facilitate the provision of gas to rural areas along the line of the main which might otherwise have had to wait some time before normal expansion made it an economical proposition to run supplies.

The references we publish to industrial and commercial uses of gas are, to say the least, highly encouraging. And regarding "commercial" uses, mention might well be made of the progress which has been made by the Newcastle-upon-Tyne and Gateshead Gas Company in the application of gas to fish-frying. In 1936 the load amounted to 72 million cu.ft. per annum; by 1939 the consumption had reached 103 million cu.ft.—the result of sales drive backed by planned tariffs for gas for the purpose, and, we would add, customer satisfaction. Nor must the industrial application of coke be forgotten or neglected. Appropriately enough we call attention in our issue to-day to yet another potential outlet for gas coke—the conversion of "waste" material into valuable animal foodstuffs.

Atmospheric Pollution

Representatives of local authorities and other bodies co-operating in the investigation of atmospheric pollution met in conference at the London County Hall on May 28. Among others, representatives of Cardiff, Dagenham, Glasgow, London County, Halifax, Manchester, Newcastle, Salford, Sheffield, Rotherham, Westminster, the British Commercial Gas Association, and Cadbury Bros., were present. The Conference, in considering its annual report to the co-operating bodies, unanimously agreed that while contribution to the war effort was the first duty and desire of every organization, the need for vigilant attention to the purity of the atmosphere had by no means decreased since the outbreak of the war. The wasteful burning of fuel, and the detriment which pollution caused to the nation's health were stressed as two aspects of the problem which must not be forgotten, particularly in wartime. The Conference, therefore, urged all local authorities to do whatever lay in their power to maintain the Investigation of Atmospheric Pollution. At the close of the meeting, Professor W. H. Roberts, of Liverpool, was elected Chairman of the Conference, in succession to Alderman Adams, M.P., of Newcastle.

1940 "Journal" Directory

Page 94. STEWARTON. J. F. Callaghan appointed M.
" 96. KILKENNY. L. W. Dalby resigned.
" 98. WATERFORD. L. W. Dalby appointed M.
" 146. LONDON AND SOUTHERN JUNIOR ASSN. C. A. Deas (New Southgate) elected Hon. Secretary vice B. W. Dawkins resigned.

Personal

Mr. JOHN H. FULTON, a member of the Technical Staff of the Glasgow Corporation Gas Department, has been appointed Technical Assistant to the Paisley Corporation Gas Department. Mr. Fulton obtained a Diploma of The Institution of Gas Engineers in Gas Engineering (Manufacture) last year.

* * *

The marriage of Mr. K. L. PEARCE, Engineer and Manager of the Bilston Gas Light and Coke Company to Miss E. S. Preedy, daughter of Mr. H. Preedy, Managing Director of Alfred Preedy & Sons, Ltd., took place on June 1 at St. Thomas's Church, Dudley. Among the presents received were a tea and coffee service from the Directors and a LeCoutre mantel clock from the staff and employees of the Bilston Gas Light and Coke Company.

* * *

Mr. W. A. GODSON, well known to the Gas Industry in Scotland and the North of England as a representative of Messrs. R. & A. Main, Ltd., was the guest at a dinner, at the Station Hotel, Larbert, given to mark his retirement after 44 years of service. Mr. G. W. Wortley, a General Manager, presided. Mr. D. Gibb, a Sales Manager, in presenting gifts from his personal friends, expressed their good wishes and those of the firm—they hoped their guest would enjoy a long and happy retirement. In replying, Mr. Godson reviewed briefly the changes which had taken place during his long period of service and spoke with appreciation of the many friendships this had brought him both in the firm and in the Industry.

Obituary

The death occurred at his home at Hall Green, Birmingham, on June 2, of Mr. GORDON MCPHERSON, of Whittaker Ellis & Co.

Letters to the Editor

An Appeal

SIR,—Your next issue of the "JOURNAL" will be published on Red Cross Day, a day on which, in happier circumstances, hundreds of gas engineers from all parts of the country would have been attending the annual meeting of The Institution of Gas Engineers in London. The present international situation has compelled them to remain at their posts of duty, but while their attention is concentrated upon the routine work of the Industry they cannot be unmindful of the war, nor of the forcefulness of the appeal on behalf of the Red Cross which Lord Luke issued over the wireless on Sunday.

Gas engineers throughout the land will want to do their best in response to that eloquent appeal, and I would like to make the suggestion that everyone who would have attended the meeting in London might consider contributing to the Appeal at any rate, some part of the amount he would have spent on his sojourn in town this week. In this way the Red Cross would receive at least as many pounds from the Institution members as it might have gathered in pence from an ordinary Flag Day Appeal. The subscribers will not miss the larger amount thus contributed, but will have the enduring satisfaction of having helped the best of good causes in a measure beyond their normal charitable inclinations.

As I consider this a matter of urgency I suggest that members who are in sympathy with this suggestion should forward their appropriate cheque this very week to their local branch of the Red Cross and St. John Fund or to the Lord Mayor of London, Red Cross and St. John Fund, Mansion House, E.C.4.—Yours, &c.,

GEORGE P. MITCHELL.

Gas-Works, Worcester.
June 3, 1940.

Stock Coal

SIR,—I was very interested to read an article in your issue of May 29 dealing with carbonization of stock coal. The following may be of interest.

In Malta my Company's coal stores were constructed in such a way that the level of the stores was considerably below yard level. As a result, every time yard level was reached in the particular store, it meant extra handling charges digging the coal out from below the level of the yard. Some years ago now, all coal up to yard level was sealed with tarmac, it being thought at the time that the properties of the coal thus treated would be for the most part preserved. It will be understood that at such a long distance from England, there is always a largish amount of coal in stock, so that, in practice, coal below yard level was seldom used.

Recently, instructions were given for the old sealed-up coal to be used as and when opportunity arose. The results have been very unsatisfactory. The gas yield has been reduced to at least 25% below normal and the coke produced is virtually useless. When used for boiler firing, a considerable quantity in the shape of fine breeze was carried into the flues and out of the chimney. It has been difficult even to work it in with other coal.

Yours, &c.,

G. MURRAY BURTON.
Secretary and General Manager.

Malta and Mediterranean Gas Co., Ltd.,
May 31, 1940.

Manchester District Association

Visit to Stockport

The Hon. Secretary of the Manchester District Association of Gas Engineers (Mr. H. Burton) informs us that the next meeting of the Association will be held at Stockport on Friday, July 5. Members are invited to assemble in the new messroom at the Portwood Gas-Works at 11.30 a.m. for an inspection of the Works.

Luncheon will be served in the Town Hall by the courtesy of the Mayor (Alderman T. E. Hunt) and at the invitation of the Chairman and members of the Gas Committee. After luncheon members will visit the works of Messrs. McVitie & Price, Ltd., at Heaton Chapel. Coaches will leave the Town Hall for this visit at 2.45 p.m., and tea will be served at the Town Hall after the visit.

Forthcoming Engagements

June.
11.—B.C.G.A.—Meeting of Members in Manchester District, Demonstration Hall, Town Hall Extension, Manchester, 2.30 p.m.
15.—Western Juniors.—Meeting at Taunton. Paper by K. G. Eccleshare.
18.—B.C.G.A.—Meeting of Executive Committee, 10 a.m.
18.—I.G.E.—Gas Education Executive Committee, 2 p.m.
28.—Waverley Association.—General Meeting, North British Station Hotel, Edinburgh.

[*There will be no meeting of the Central Executive Board of the National Gas Council during the month of June.*]

July
5.—Manchester District Association.—Visit to Stockport.
13.—Western Juniors.—Summer Meeting at Minehead.

August.
13.—Irish Association.—Annual General Meeting at Dublin.
24.—Scottish Western Juniors.—Paper by J. Fulton on "Ammonia Recovery."

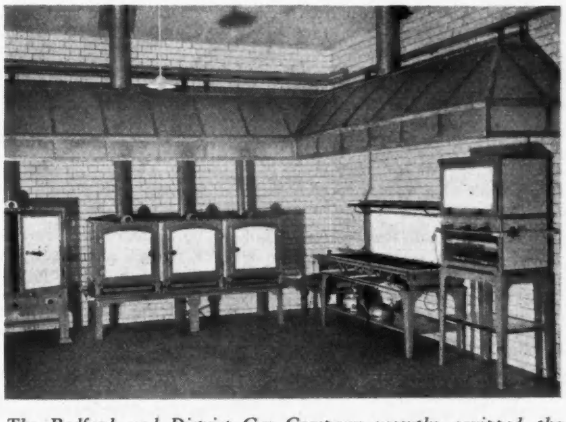
Revised British Standard for A.R.P. Signs

A B.S. Specification for A.R.P. Signs (BS/ARP/32) was issued in November, 1939, and laid down the size of the signs and the standard wording to be used. The degree of illumination was referred to only in general terms, and a note drew attention to the fact that it was hoped eventually to issue an addendum giving details of suitable lighting fittings.

The revision of the specification which has just been published goes a good deal further than this. There are 11 drawings illustrating various types of fittings for the lighting of location signs and direction signs, and reference is made to luminescent signs. The clauses dealing with the brightness and with the control of light have been amplified and details of the method of testing signs for compliance with these clauses are included in an Appendix. This is a particularly useful addition to the specification, and manufacturers wishing to obtain licences for the use of the B.S.I. certification mark now know exactly what test conditions have to be complied with.

A further addition to the specification is an Appendix on alternative lighting for emergency use, as a provision against the event of mains failure.

Copies of the Specification BS/ARP/32 can be had from the British Standards Institution, 28, Victoria Street, London, S.W.1, price 6d. each (post free 8d.).



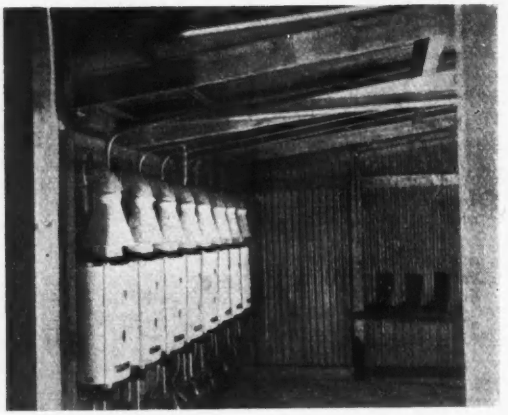
The Bedford and District Gas Company recently equipped the kitchen of the Bedford County Hospital with Radiation large-scale cooking apparatus. As indicated by the above photograph, the arrangement of the kitchen is so planned as to allow for efficient service and quick delivery of cooked meals to the various parts of the Hospital

Carrying Conviction for Gas

Water Heaters in the Service of A.R.P.

EVER since the letters "A.R.P." first began to have any significance to the people of this country the Gas Industry has been fully conscious of the opportunity which here exists for performing one more vital national service. Indeed, for some considerable time past the columns of the "JOURNAL" have borne testimony to the many and varied ways in which gas can contribute towards the efficiency and efficacy of A.R.P. work generally. To-day, perhaps, the need for efficiency in all branches of A.R.P. is more imperative and urgent than at any time since hostilities began, and it is no exaggeration to say that in the event of certain forms of air attack the provision of immediate and ample supplies of hot water for the treatment of casualties would be absolutely essential.

The Gas Industry well knows that a number of reliable and efficient appliances are available for this purpose, and it will note with interest the publication by Ascot Gas Water Heaters, Ltd., of a comprehensive booklet on the subject of hot water for A.R.P. requirements. Some 20,000 copies are to be sent out



In this Decontamination Centre, eight "ASCOT" multi-point gas water heaters are installed for the operation of 16 showers at a controlled temperature of 100° F. The water supply is from two 500-gallon tanks, and mixing valves are fitted to each pair of showers

almost immediately—carrying conviction for gas to all parts of the country, to authorities of all kinds who are connected directly or indirectly with or are responsible for A.R.P. installations.

The well planned and printed publication is aptly entitled "Ascot Render Practical Service," and consists of eighty pages devoted to illustrations and descriptions of a large variety of "Ascot" A.R.P. hot water installations throughout the country. The preface forcefully calls to mind A.R.P. work which cannot be neglected in any preparations we may make for aerial attack, and at the same time convincingly puts the case for gas in the provision of hot water and the part "Ascot" appliances are already doing and will continue to do in this vital work. In the limited space at their disposal the firm have shown more than sixty photographs of decontamination centres, first-aid posts, canteens, &c., brief specifications of suitable "Ascot" gas water heaters, an impressive map indicating 630 towns where many thousands of their appliances have been fitted for purposes of National Defence, and a list of further "Ascot" technical publications which deal with practically every angle of instantaneous water heating by gas.

The Managing Director, Dr. Bernard Friedman, introducing the new publication at a recent gathering at the Neasden Works, summed up its aims in the following words: "I hope you will accept my sincere and most conscientious statement that although outwardly a purely commercial feature, I was guided by the desire to make a contribution to National Defence by placing ourselves and our whole organization in the service of this cause."

A Series of Ration-time Cookery Demonstrations recently held at Consett, Durham, by the Shotley Bridge & Consett Gas Company, in collaboration with the Parkinson Stove Company, proved highly successful. Lectures on attractive and nourishing menus were given by Miss Dorothy Scott, of the Parkinson Stove Company, Ltd., and the audiences were extremely appreciative of the assistance given towards the solution of their wartime catering.

Continuing the Series of cookery demonstrations organized by Mr. H. Bottomley, of the Caledonian Gas Corporation, Ltd., lectures on attractive ration-time menus were given by Miss Barbara Cobb, N.C.D.S., of the Parkinson Stove Company, under the auspices of the Beith Gaslight Company. The audiences were very appreciative of the assistance given in the preparation of dishes, which combined appetising appeal with high nutritive value, despite restrictions.

Newcastle Company Stage Exhibition of Appliances for Fish Fryers

WHEN the National Federation of Fish Fryers held their Annual Conference recently at Whitley Bay, Northumberland, it was suggested by the Newcastle-upon-Tyne and Gateshead Gas Company that as an added interest to the Conference it might be possible to arrange a small exhibition of fish-frying ranges and other equipment for the fish-frying trade. As the result suitable accommodation was obtained in premises adjoining the Hotel at which the Conference was held, and a small but representative exhibition was brought into being.

The range manufacturers exhibiting consisted of the Acme Engineering Co., Ltd., Frank Ford, Ltd., J. Rouse & Co. (Oldham), Ltd., while the Crypto Speciality Department of the Lancashire Dynamo & Crypto, Ltd., exhibited their potato chipping machinery. The Exhibition in general was supported by a display of other apparatus suitable for the extended activities of the modern fish restaurant. This consisted of café sets as manufactured by James Stott & Co., and Jackson Boilers, Ltd. A comprehensive range of toasters, milk and soup warmers, and hot cupboards suitable for the storage of previously prepared food was also on show.

The Exhibition as a whole was of considerable interest to the delegates attending the Conference, and as the weather throughout the period of the Conference was particularly bad, the refreshment facilities provided at the Exhibition in conjunction with Messrs. Stott were very much appreciated by the visitors. During the three days the total number of visitors was 247, and the actual apparatus sold represented a total of £776 16s. Several good enquiries were received in addition.

The use of gas for fish-frying has made substantial progress in the Newcastle district during recent years. In 1936 the figure was 72 million cu.ft. per annum; by 1939 the consumption had reached 103 million cu.ft. per annum. There are exactly 500 fish frying establishments in the Newcastle Company's area of supply, of which 212 depend entirely on gas, 83 make use of part gas and part solid fuel, and the remaining 205 depend entirely on solid fuel. Perhaps the most significant item is the number of pans employed and the relationship between gas and solid fuel. In this respect, the Newcastle Company as distinct from the recently-absorbed South Shields Gas Company, has in operation 670 gas pans and 421 solid-fuel pans. When the Newcastle Company absorbed the South Shields Gas Company there were in operation 14 gas pans and 208 solid-fuel pans. The Company, however, forthwith introduced its fish-frying tariff, and the numbers are now 42 gas pans and 187 solid-fuel pans; but for the outbreak of hostilities the number of gas pans would have substantially increased during the last nine months as it was becoming rapidly apparent that fryers in the South Shields area were becoming as gas-minded as those in Newcastle.

The fish-frying tariff to which reference has been made is as follows: The published price for the district is charged in respect of the first 25 therms of gas consumed per pan connected per quarter. In respect of all gas consumed in excess of these 25 therms per pan connected the price is reduced by 2.5d. per therm. Further to induce the use of gas to the exclusion of other fuels an additional cash discount is allowed of 5% where gas only is used. The published price and the special price are, of course, subject to the usual 10% discount.

Western Junior Gas Association

On Saturday, May 18, a very enjoyable afternoon was spent by members of the Western Junior Gas Association at the works of the Bridgwater Gas Light Company. They were welcomed by Mr. J. H. Cornish, Snr., Managing Director of the Company.

Before inspecting the new Woodall-Duckham carbonizing plant, coke-grading plant and electric generators, the members were given some interesting technical information by Mr. J. H. Cornish, Jnr., Secretary of the Company. After the inspection of the works plant members adjourned to the Royal Clarence Hotel to hear a Paper on "Works Plant and Processes" by Mr. L. R. Cowley (Cheltenham). This was followed by a tea kindly provided by the Bridgwater Gas Light Company.

The thanks of the Association to their hosts were proposed by Mr. A. B. HORSFIELD (Bristol) and seconded by Mr. A. G. HOLTAM (Cheltenham). Mr. J. H. CORNISH, Snr., in reply, said that the Association were always sure of a welcome at Bridgwater.

Although Tyneside Authorities who acted jointly in the opposition to the Newcastle-upon-Tyne and Gateshead Gas Company's Bill in the House of Commons, have decided in view of divided opinions not to continue joint opposition in the House of Lords, the Newcastle City Council and the Gosforth Urban Council are combining to lodge further opposition when the Bill comes up in the House of Lords. Their particular ground for opposing the Bill is the proposed gasholder at South Gosforth. A meeting of residents has decided to join in the opposition and has appointed a committee to raise funds for that purpose.

SOCIETY OF BRITISH GAS INDUSTRIES

Report of the Council for 1939-1940

THE following Report would have been presented at the Annual Meeting of the Society which would have taken place to-day, but which, due to the international situation, had to be postponed.

It is with the greatest pleasure that the Council is able to announce that Sir Francis Joseph has kindly consented to serve as President of the Society for a further year.

On the outbreak of war the Council decided that the affairs of the Society would be best conducted by the Emergency Committee with power to co-opt. This Committee has met at regular intervals, and the Council has been kept in the closest touch with its work and decisions. One full meeting of the Council has also been held since the outbreak of war to enable the Council to review the general conduct of the Society's affairs and to discuss several important questions of policy with the Emergency Committee.

The Society's normal procedure is to retire the Officers and a third of the Council each year, but since the Council has delegated its powers to the Emergency Committee, many members of Council are not being called upon to give the Society the full benefit of their assistance and experience, and it does not seem to be in the interests of the Society that valuable services should thus be lost under existing conditions. In these circumstances, and after consultation with the members, it has been decided to follow the example of many other Associations and to put a resolution to the annual meeting which will provide for a " standstill " arrangement for the coming year.

The transitional period from a peacetime to a wartime basis has proved no less complex for the Gas Industry than for the other great industries, and in particular the public utilities of the country.

The Society, in common with the other national organizations in the Gas Industry, found certain of its normal activities necessarily curtailed or suspended, and was brought face to face with a large number of new problems which had to be dealt with with the least possible delay. The machinery, however, symbolized by the British Gas Federation, which had been created in peacetime to deal with problems of common concern to all branches of the Industry, stood it in good stead, and the Society was able and ready at once to play its part where the interests of its members were affected.

It is clear, however, that nothing approaching a static position is likely to be reached in the affairs of the Industry so long as the emergency lasts, and in the Council's view therefore it is very evident that the Society must be available and ready to deal with each and every new situation as and when it arises.

The Institution of Gas Engineers and the Society, as stated in the last Annual Report, had been requested by the British Gas Federation to appoint a Joint Committee to examine the whole question of setting up a Research Body for the Industry. This Committee had prepared a draft scheme, which had been approved by the British Gas Federation, and the Committee had been authorized to proceed with the formation of the Gas Research Board. Nine representatives were appointed by the Institution and six by the Society to serve on the Council of the Board, and the Council held its first meeting in July. The movement arose from the conviction that the Gas Industry needed to be placed on a footing of equality with other industries which had founded autonomous research associations recognized by the Department of Scientific and Industrial Research. Consideration was not, however, to be given to the question of financial assistance from the Department until some experience had been gained from the initial operations and activities of the Board. The outbreak of war has of necessity prevented the full development of the project on its initiation, but the Board has already taken over the responsibility for the whole of the research work which was already under the direction of the Research Executive Committee of the Institution, and with the permission of the Institution Council, Dr. W. T. K. Braunholtz has been appointed Acting Director of Research. The Board will also be responsible for dealing with certain technical problems which are being and doubtless will be entrusted to the Gas Industry as part of its contribution to the successful prosecution of the war.

The Board has now been constituted as a legal entity, and the members of the Society are to be invited and indeed urged to become subscribing members. Their membership will be accepted on payment of a minimum annual token subscription of five guineas, but it is hoped and, in fact, already known, that some members will subscribe more than this amount as an initial subscription. When normal times return all members of the Board from among contracting and manufacturing firms will be asked to bear their fair share proportionately to the contributions of gas undertakers in the research work of the Industry.

The mutual desire for closer co-operation between the Institution and the Society, of which the negotiations in connexion with the formation of the Gas Research Board were clearly indicative, has received a further stimulus since the outbreak of war. In a number of cases problems have arisen where it has been imperative to secure the co-operation of contractors and manufacturers, and there is every reason to believe that pressure of circumstances in these times will emphasize increasingly the necessity for an organization which can secure the co-operation of firms engaged in the Industry, and can speak with authority on their behalf.

The question of the provision of plant of special importance at the present time is but one example, and another is some amelioration of the blackout which the Ministry of Home Security asked the Gas Industry to secure by the provision of standard wartime street lighting units. These were designed and are now being produced by members of the Society.

Just prior to the war a Joint Committee of the Institution and the Society had been set up primarily to formulate a new Standard Clause covering War Risks, and also to consider and report as to the desirability of revising the present Standard Conditions of Contract. As a result of the work of this Joint Committee, which was carried out in a spirit of mutual understanding under the Chairmanship of Mr. George Dixon, President of the Institution, an amended Clause XXII, Responsibility for Damage, and a new Clause, Rise and Fall, were approved. These Clauses have been well received throughout the industry, and have been noted with appreciative comment beyond the confines of the Industry. The question of a general revision of Standard Conditions of Contract has been approved in principle, but it has been decided that the task should be adjourned until a more opportune time.

The B.C.G.A. has been placed on a wartime basis of reduced commitments, and the Society has therefore come to an arrangement with that body under which a subscription has been made as a token of our co-operation until times are normal again, while representation on their wartime Executive Committee has been retained. There is important work for the British Commercial Gas Association to do, and the Society is glad to be able to continue in close association with it.

The Society's membership of and close working relationship with the Federation of British Industries has been of the greatest importance in dealing with a large number of questions of varying degrees of concern to the Society's members since September, such as the following: War Risks Insurance Act, Import and Export Licenses, Price Increases, Conditions of Contract, Excess Profits Tax, A.R.P., War Damage to Property, and Personal Injuries (Civilians) Scheme.

The Society is maintaining its close co-operation with the British Standards Institution, the British Refractories Research Association, the Department of Coal Gas and Fuel Industries, Leeds University, the Women's Gas Council, and other kindred organizations and Departments.

Immediately on the outbreak of war effect was given to a resolution of the Council offering the Society's services to assist the Government in any and every way possible.

As time progresses, the declared policy of the Government to work through the trade organizations of the country in their contacts with Industry is bringing the Society into official, and indeed closer, touch with a widening sphere of activity.

There has been official contact with the Society in connexion with the needs of its members for the raw materials of production, and there seems every likelihood that as the requirements of the Defence Services in relation to available supplies increase, the services of the Society will be called upon further. Moreover, the Supply Departments have accepted with gratitude a compilation prepared with the assistance of those of the Society's members who were anxious to obtain work for the Defence Services, showing the potential capacity which exists among members for such work. It is beyond question that the successful prosecution of the war demands that all available industrial capacity should be utilised to the best advantage and to the full, and the Society is in a position to render assistance both to Government Departments and to its members to this end.

The Society is represented on the Gas Engineering Sub-Committee, Central Register, Ministry of Labour, and on a number of Regional Panels. The Society is officially associated with the work of the Export Council.

The Council feels that it is no more than appropriate to the times that its Annual Report to the Society's members should be brief. A wide range of detailed activities have therefore received no more than bare mention, and reference to others has been omitted. The Council, however, wish in particular to record that it has noted with pleasure as good augury in those difficult times the promptitude with which members have paid their annual subscriptions this year, and the unanimity with which those with the greatest and most intimate stake in the Industry have acceded to the Council's request for support of the Special Fund on a reduced basis, but one which nevertheless affords every prospect of the Society being able to carry on and to function in a way which will be adequate for the present and will not prejudice the future.

Prior to the outbreak of war, the Society could look ahead to the future with confidence, since internally its strength had markedly increased of recent years, and externally more and more was it being called upon to fulfil the functions appropriate to the interests it represented. The possibilities which were before it remain against the day when peace returns, and the Council looks to the members for their continued and loyal support, since the Society's efficient working is essential to meet the problems of to-day and it must be kept ready, intact and animated to resume in due time its more normal activities and to meet the problems of to-morrow.

DEVELOPMENTS IN THE INDUSTRIAL FIELD

Gas in the Shoe Industry

THESE notes show the extent to which gas is applied as a source of heat in the manufacture of shoes and will, the writer hopes, give a glimpse into the various stages in the make-up of the shoe. Gas is employed so extensively because of its nicety of heat control, so essential to efficient production in this particular branch of industry.

Gas, as a source of heat, is utilized in a great number of processes throughout the manufacture of the shoe, in shrinking the leather to conform to the shape of the last, and in drying out any excess moisture in the leather.

For reinforcing the toe-cap of the shoe thermo-plastic puffs, a bituminized fabric, are inserted between the upper and the lining, and have to be heated preparatory to the lasting operation. The puffs are usually heated over a bath of hot water, as the best results are obtained with a moist heat. After the puffs are fixed to the uppers, the toes are again softened in a gas heated puff vapour heater to facilitate the pulling-over process. The gas jets can be readily adjusted to obtain the correct mixture of water vapour and hot air. A large tank is fitted to maintain, by means of a chicken feed, the correct level of water in the boiler.

For pounding foreparts, waists, and heel seats of shoes after they have been lasted, a rotary pounding-up machine is used. Tacks are driven home, and the upper is drawn tighter to the last. A grater trims away superfluous material from the toe, the trimmings being removed by a fan. The machine is provided with gas heated feather and seat back beating irons, a gas heated toe blocking hammer, and a shoe blocking wheel for ironing the uppers on the foreparts and in the waists.

Wax Heating

Now we come to uniting the welt, upper, and insole, using a hot waxed thread, for which purpose a chainstitch machine is commonly employed. The wax and necessary parts of the machine are heated by steam from a small gas-fired generator. The thread passes through a bath of melted wax which serves the dual purpose of preserving the thread and sealing the holes caused by the stitching. Another type of stitching machine using the lockstitch is used for attaching outsoles to middlesoles or rands, before or after attachment to the shoe. Here again the wax is heated by gas.

In the manufacture of "Veldtchoen" Shoes for lasting and stitching, either with or without rands, a combination machine is used. A mechanically-controlled pincer, incorporated in the machine, operates immediately in advance of the needle, and draws the upper tightly to the last, the strain exerted by the pincer being under the control of the operator, and is adjustable to suit all grades of uppers. Once more, for waxed thread, the machine is heated by gas.

Gas is the heating medium for bobbin winding machines for winding cops of waxed threads for use in the sole stitching machine.

A high-speed chainstitch machine is employed for sewing outsoles, &c., on to boots, shoes, and slippers. The thread is passed through a heated wax pot and then through a gas heated, horn-shaped turntable to the needle.

The soles of the shoes are surface dried over a gas-heated hot air tank prior to the scouring of the soles before polishing. This is necessary to ensure a smooth surface being obtained, without loose fibres.

Drying chambers are now used to shorten the drying period, which takes approximately 24 hours for natural drying. By using the drying chamber, however, this period is shortened to approximately 1 hour. Air is heated by being blown over hot water pipes into the drying chamber, the humidity being carefully regulated to prevent over-drying. A gas-fired boiler supplies the heat source for the hot water. This plant has enabled shoe production to be speeded up tremendously.

A feather opening machine opens the feather of the shoe previous to edge trimming by means of two beating tools, one for the forepart and one for the waist. These beating tools are gas-heated to facilitate the working of the leather.

The "Louis" heel is very popular among ladies. The flap is glued to the heel breast by means of a breast flap tab forming machine which also irons out creases, particularly at the junction of the heel and waist, and forms the tab to fit under the top piece. The machine embodies a chopping knife which cuts a "V" shaped tab at the end of the flap, and this tab is folded over by a rotary tool and secured to the tread face of the heel, forming an effective anchor for the breast flap. The tab is afterwards thinned down to the substance of the heel cover by means of a scouring disc covered with a sticky-back abrasive, to provide a flat surface for the top piece. A steaming device is fitted, which is heated by gas, from which a jet of steam is used to soften the glued surface of the tab before it is folded over.

Top-pieces are set on attached wood heels by a setting tool in the form of a three-step disc iron, which can be cut to give lip and crease effect, or can be cut flat, or bevelled, as the shape of the heel may demand. The iron does not rotate, but oscillates only to the extent of 7°. The pressure of the top-piece against the setting tool is governed by a treadle-operated strap that half encircles the heel of the shoe, holding it and moving round with it, as the top-piece is set. The strap forms an endless loop and is carried over rollers above and at the rear of the setting tool, which is gas heated.

For setting the edges of foreparts and waists, an automatic edge setting machine is used. The shoe is clamped in the jack, and the forepart edge, from joint to joint, around the toe, is set automatically and speedily with an oscillating edge iron. The waist is afterwards set on the waist setting attachment, for which process the shoe is held and guided by the operator. All classes of edges may be set, from the lightest to the heaviest. Either plain edge setting irons or combined edge setting irons and stitch wheels are used and are heated by gas.

Branding and Treeing

Branding the shoes is carried out on a stamping machine. A revolving head is fitted to carry eight stamps which can be used either hot or cold. Heating is carried out by gas, and the shoes are supported by combined spring and hydraulic pressure which can be set to give any depth of impression, automatically compensating for any variation in sole substance.

Before being packed, the shoes are subjected to the operations of a pneumatic treeing machine. Hot air is applied to the shoe by a hot blast tool which takes the form of a pistol, having a special combustion chamber in which heat is generated by gas, and is transmitted through the nozzle of the pistol by a blast of air. The heat generated may be varied, but is consistent to each setting. The pistol is fitted with an ironing attachment for removing pleats and creases where it is found, in certain instances, that the hot blast does not fully remove them.

Gas Conditioning Units

Their Application to Paint and Varnish Manufacture

FOR many years the Incandescent Heat Company has specialized on gas conditioning plants for producing suitable atmospheres for bright annealing of ferrous and non-ferrous materials. These units, which are manufactured with capacities from 500 to 10,000 cu.ft. of conditioned gas per hour, usually employ standard town gas as a base, the volume of conditioned gas produced being three to four times that of the base gas used.

By the introduction of this protective atmosphere in the furnace and cooling chambers and the provision of special sealing devices preventing both the escape of the gas and inward seepage of the atmospheric oxygen, heat treatment without detriment to—in fact, with improvement of—surface finish, is obtained, the high cost of secondary cleaning operations is entirely eliminated, and the consequent economies render the application of this process essential in industries where high quality product with lowest production costs is necessary.

The use of chemical atmospheres of known and controllable composition is applicable to many branches of industry in addition to that already mentioned, and has been successfully applied to paint and varnish manufacture.

Its introduction to this country, after being adapted for this purpose in the U.S.A., has evoked considerable interest, and for this reason we are summarizing briefly its advantages and principle of operation.

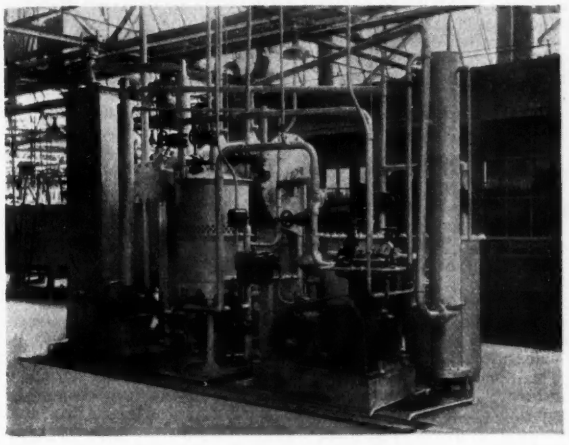
(1) The inert gas produced by the apparatus is a complete substitute for CO_2 at a very small fraction of its cost.
(2) The mixing and agitation of synthetic varnishes are accomplished with increased efficiency and superior colour control.
(3) The gas supplied to varnish kettles is inert.
(4) The gas may be applied to storage tanks with complete prevention of oxidation and skinning.
(5) The inert gas is a most reliable means of protection against fire outbreaks.
(6) Pipe lines are blown out and kept clean.
(7) The operating costs, including maintenance, depreciation, and all other items, are extremely low as compared with savings

DEVELOPMENTS IN THE INDUSTRIAL FIELD

effected. For instance, liquid or frozen CO_2 costs 20s. to 25s. per 1,000 cu.ft. compared with approximately 6d. per 1,000 cu.ft. for the new gas manufactured from standard town gas.

Description of Plant

The base gas is fed into the system and controlled by a Selas electrically-driven quality governing mixer, which maintains with precision, correct air-gas ratio proportioning. The gas is then



burned in a refractory lined combustion chamber and passes from this chamber for primary and secondary dehydration.

Primary dehydration is of the ordinary surface condenser type and the secondary and final dehydration is by means of the regenerative silica gel system. Finally, any remaining traces of sulphur are removed by a de-sulphurizing unit. From the de-sulphurizing chamber the gas passes into a compressor, and is ready for delivery to the storage tanks, resin kettles or for other operations about the plant.

The silica gel unit consists of two adsorbers containing the necessary charge of silica gel complete with activation fan and the necessary connecting pipework and valves. This unit works on the principle of one adsorber drying while the other adsorber is being re-activated by the passing of hot air through the silica gel; the changeover being necessary every eight hours.

The equipment is completely automatic. The amount of gas is co-ordinated with the demand for inert gas at the point that it is drawn from the line. The high pressure compressor, which delivers the gas as required, is provided with automatic equipment to idle when the demand is cut off and to open when the demand arises. Governors are provided to maintain pressure in the storage tank at a constant value and to operate the compressor so as to obtain this result.

One important feature of this equipment is an Analygraph, which is arranged to take a continuous sample of gas as manufactured, and record on a chart any variations in the gas composition.

Typical Gas Composition

The gas produced by the generating unit may be adjusted to have a wide range of different compositions.

In the paint and varnish fields, its widest application is to supply a strictly neutral inert atmosphere which will not support combustion and which has no appreciable fuel value, so that it cannot be burned. A typical analysis of this gas is given below:

Carbon Dioxide	10%	Oxides of Nitrogen (traces)	0%
Carbon Monoxide	1.9%	Water Vapour	0.1%
Oxygen	0%	Nitrogen	88%
Sulphur	0%		

It will be noted that the gas is substantially carbon dioxide and nitrogen. The water vapour content can be kept down as low as 0.1% by the use of the silica gel plant, and the temperature of cooling water on primary condensers, which varies considerably during summer and winter, has no appreciable effect.

A plant to supply approximately 1,250 cu.ft. of conditioned gas per hour at 35 lb. pressure is shown in the accompanying illustration.

Gas Service for the Modern Army

An annual gas consumption of well over 150 million cu. ft. is involved in one of the largest contracts of its kind ever placed by the War Office in connexion with the power, heating, water heating, and cooking requirements of an extensive military establishment "somewhere in the South of England." A "Journal" representative recently interviewed the Managing Director of the Gas Undertaking that has been entrusted with this big new addition to its industrial load, and had a long distance view of the premises which are still in course of extension.

THERE is much that, for the present, must be left unsaid about the new "Soldier's Dream of Home" which adds beauty rather than ugliness to that part of the country in which it is situated, but the point that lends especial interest to its development from the viewpoint of the gas engineer is that the whole of its heat requirements will be met by gas. The contract is for a period of 21 years and is for gas not only for the married quarters but to the whole establishment for the purposes of central heating, hot water supply, and cooking. Originally the load was estimated at 150 million cu.ft. per annum, but it is probable that this figure will be considerably exceeded as the depot is extended. The local Gas Undertaking that has secured the contract was already making big industrial progress and has still further extended its plant to cope with the increased output.

Not an ounce of coal will be used at the depot, which is one of the most extensive in the country. The depot comprises four complete "Sandhurst" blocks, each pair complete with its own regimental institute and parade ground, and each equipped with a huge dining hall, fitted with unit heaters, and a most modern kitchen. Locally it is claimed that there is no kitchen in London to compare with them. A short distance from the barracks are the married officers' and married soldiers' quarters—a remarkable housing estate already embracing about 400 houses. The whole scheme represents a vast improvement on the old conception of army accommodation. The floor of each barrack block is planned into self-contained sections to serve any number from six to twelve men. The layout ensures a maximum of light and sunshine for the interior of the buildings, and the scheme of decoration gives an atmosphere of cheerfulness.

All the corridor floors are laid with polished red asphalt and the rooms are floored with jarrah wood. Beside each bed in the dormitories is a steel wardrobe with hangers and drawers, and wash basins with hot and cold water, and surmounted by mirrors, are available in the ablution rooms. Every dormitory has a glazed tiled bathroom with a panelled bath, and an adjoining room contains four cubicled shower baths. These also are glazed tiled, and hot, tepid, and cold water can be turned on at will. There are cleaning rooms, with taps, slate benches, and sinks for the miscellaneous cleaning operations that crop up in a normal soldier's day's activities, and drying baggage rooms are also provided.

The sitting rooms have a homely touch, with effective wall panelling and plug-in fittings for radio sets. The dining halls, which are 160 by 40 ft., can each accommodate about 550 men, and each is fitted with six unit heaters in the ceilings. The cleanliness of the kitchens, tiled preparation rooms, and stores is an impressive feature of the depôt. The whole scheme has

A Corner of One of the Kitchens

been carried out on garden city lines, and every possible amenity is provided for the welfare and comfort of the officers and men.

Besides the main barrack blocks and the separate estate of married quarters there are many ancillary buildings, including officers' and sergeants' messes, garages and workshops, and when the depôt is completed it will also include sports pavilions and other facilities for outdoor recreation. Gas is employed for raising the whole of the steam required for the unit heaters and for the steam cooking in the kitchens, and each of the four main blocks represents a daily gas consumption of something like 130,000 cu.ft. In every one of the houses on the married officers'

estate there is a Potterton boiler and a Main cooker, together with gas fires in bedrooms and gas-coke fires in the drawing-rooms. Even the new sewage works is equipped with a gas boiler for steam raising.

The gas-fired boilers employed in raising the main steam supply for central heating are of the Cochran Kirke type, and the kitchen equipment consists mainly of cooking ranges by Benham and Sons and Sumerlings. The present total daily consumption throughout the depôt is in the neighbourhood of 750,000 cu.ft.

The houses for the married officers and men bear favourable comparison with any modern housing scheme. Those for the officers are pleasant detached and semi-detached residences, the sizes of which depends upon the rank of the officer and the size of his family. The families of other ranks are accommodated in small dwellings, usually of the two or three bedroom type, depending, again, on the size of the family, each fitted with Ascot Water Heaters, Main Cooker, 1 Gas Fire and 1 Coke Fire. Schools and playgrounds are being provided for the children and some kind of social centre will probably be added at a later date. The old idea that a barracks was something akin to a prison has been completely banished from this new development, and the authorities have been wise in deciding that the premises shall be entirely free from smoke and dust.

The erection of a vast new military depôt some miles from the nearest town has, incidentally, involved considerable extensions of mains and laying of new roads to cope with the demands of heavy traffic. An indirect outcome of these extensions has been to facilitate the provision of gas for rural areas along the line of the main, which might otherwise have had to wait a considerable time before normal expansion made it an economical proposition to run supplies.

From Food Waste to Feeding Stuffs

A New Outlet for Gas Coke

THE estimated quantity of waste food collectable from town and urban districts is about 12,000 tons per annum per million of population, or 350,000 tons from England, Scotland, and Wales. Though all this "waste" material can readily be converted into valuable animal foodstuffs, it is unfortunately a fact that at the present time the vast bulk of it is still going via the dustbin to the refuse destructor or tip.

The last pre-war Board of Trade returns showed that we imported 1,000,000 tons of animal feeding stuffs in six months—to a value of about £5,000,000. On the basis, therefore, of one ton of dried food product from every four tons of waste material dealt with, we could save something like 90,000 tons of imported material.

Waste food may keep in good condition for a week or two in cold weather, but in summer may rot, ferment, and lose its food value in a very short time. If it is dried and sterilized it will keep in good condition for a year or more. Waste food contains about three parts water to one part of useful food matter. After drying and evaporating the moisture the material is much more easily and cheaply stored and transported as it is only one-quarter of the weight and bulk of the original waste food. It is most essential to build up during the summer a reserve of feeding stuffs that can be kept for winter feeding. Indeed, the shortage of winter feeding stuffs during the first six months of the war was so serious that it was found impossible adequately to maintain our livestock and poultry. Many farmers could obtain only 25% to 30% of their essential requirements. The importance, therefore, of making ourselves more self-sufficient in feeding stuffs cannot be overemphasized.

The constituents of waste food will vary considerably at different times of the year, and may in varying degree be deficient in essential contents necessary to provide a good animal foodstuff. In such cases, scientific proportions of other food material may be blended in to make good the deficiency.

Plant Available

There are a number of manufacturers of animal feeding stuffs with plant available for drying waste food. They have skilled staffs and distribution organizations available. As an example, the British Feeding-Meals & Milk Products Co., Ltd., have at Stratford plant available for drying half the 100,000 tons per annum of waste food from all the London Boroughs, and could extend their plant to deal with the whole of it. We had the opportunity the other day, in company with a number of Members of Parliament and representatives of local authorities, of inspecting this very efficient plant, where the raw material (fish waste) handled per annum prior to the war was 22,000 tons—producing 5,100 tons of white fish meal. Additional purchases of 6,200 tons of meal were also used for blending—making a total annual output of 11,300 tons of feeding meals.

When the Ministry of Agriculture's campaign to save kitchen waste was launched, this firm foresaw the possibility of utilizing their existing plant and undertook experiments which proved that food waste can be processed quickly and economically and turned into a first-class animal foodstuff by the addition of certain meals.

In this particular plant the raw material is sterilized at a temperature of 250° F., and the drying is completed at a temperature of 250° to 200° F. The plant includes three continuous type drying machines each capable of handling 32 tons of raw material per 24 hours, two of them being arranged to work in conjunction with a pre-cooking and pressing plant handling a maximum of 120 tons per 24 hours. Three grinding plants handle a total of 5 tons per hour, or 250 tons per week—working one shift only.

Best Efficiency from Large Units

It is emphasized that the best efficiency with such plants can be obtained in large-scale units, and for every individual local authority or for private enterprise to lay down drying and grinding plant to treat the waste foodstuffs from their own area alone would probably prove to be an uneconomical proposition. A limited number of large-scale plants in centres of high population, together with efficient transport facilities from outlying areas, would, generally speaking, be the best means of tackling this proposition.

It may be mentioned that grass cuttings from lawns, parks, and sports grounds can also usefully be added to the kitchen waste and makes an excellent constituent of the final dried product. Those familiar with the now well-established grass-drying process will, of course, appreciate this fact.

The London and Counties Coke Association have played some considerable part in the development of drying, processing and preparing waste food for animal feeding, and are taking an active part in the investigations now proceeding in the recovery and utilization of waste material suitable for preparation as animal food. Any gas undertakings interested in this outlet for their coke and desirous of putting the facts before their local authorities may obtain further particulars from the Association. As a general guide to the value of the load, it may be stated that to convert 4 tons of waste food to 1 ton of dried product requires 12-15 cwt. of coke—or 3-4½ cwt. of coke per ton of raw material treated. There is no doubt that quite a useful potential market for coke exists in this new development, which is also providing an essential national service.

Gas for the Poultry Breeder

Novel Window Display at Cannock

A GREAT deal of interest was created by a recent showroom window display by the Cannock District Gas Company. The reason was not far to seek, for the display was—literally—a live one, consisting of a practical demonstration of the use of gas for the incubation and brooding of chickens.

The incubator was placed in the showroom window during the last two days prior to hatching, while for a further fortnight the chicks were running about in the window, where the brooder was installed. A hundred eggs were initially placed in the incubator, and after a week they were tested for fertility—fifteen being discarded. Of the remaining 85, no fewer than 81 were successfully hatched with a gas consumption of three therms. Suitable showcards were placed in the window, and a few pieces of turf helped to make the "chicken run" more realistic. Needless to say, the display proved an enormous attraction to local children—in fact, Mr. C. R. Ingham (the Engineer, Manager, and Secretary of the Cannock Company) observes that the window glass at about the six-year-old nose level had to be cleaned daily!

As a result of this effort, a number of useful enquiries relating to the application of gas for this purpose were received by the Company and are being followed up—which is all to the good in these days when increasing attention is being focussed on home-produced food supplies. Mr. Ingham considers the display to have been well justified, not merely by reason of the business enquiries resulting, but also on account of the interest and goodwill occasioned by such a display. Indeed, many children, accompanied by their parents, made daily, and even more frequent, pilgrimages to see it.

The accompanying illustration gives a view of the display, the incubator and brooder for which were kindly loaned by Mr. H. W. Stephens, of Gloucester.

Company Meeting

UNITED KINGDOM GAS CORPORATION

The Fifth Ordinary General Meeting of the United Kingdom Gas Corporation, Ltd., was held at the Registered Office of the Corporation, 9, Clements Lane, London, E.C.4, on Monday, June 3—Mr. R. B. H. OTTLEY (Chairman) presiding.

The REPRESENTATIVE of the SECRETARIES (Close Brothers, Ltd). read the notice convening the meeting, together with the Auditors' report on the balance-sheet.

THE CHAIRMAN'S ADDRESS

The CHAIRMAN, moving the adoption of the Directors' Report and Statement of Accounts for the year ended Dec. 31, 1939, said : We have made it a custom to show in the accounts the comparative figures of the previous year, and you will observe that they reflect a further growth, but not to the extent of previous years, for reasons which will be appreciated by all shareholders. I would here make brief reference to the investments of the Corporation in "other companies," as distinct from subsidiary companies. These investments have been included in the balance-sheet at cost, which valuation the Board decided to maintain after full investigation in existing circumstances.

Expenditure shows an increase, principally due to the rise in the rate of income tax. We are, however, able to carry forward, after making the provisions as set out in the Report of the Directors, the sum of £14,150, as compared with £13,276 brought forward from last account.

The results shown by the Caledonian Corporation, which is wholly controlled by this Corporation, indicate that further progress has been made during the year, and the dividend has been maintained.

This, then, is the financial condition of our Corporation. I think you will agree with me that, in view of the circumstances, we have a right to a feeling of modest satisfaction at the results obtained.

We started the year with high hopes, and indeed until the outbreak of war we had every reason to anticipate that they would be realized. Sales of gas and appliances had increased enormously, and we had no reason to suppose that these would not be reflected in increased profits in our Companies; but, alas, the necessary restrictions and rises in costs attendant upon wartime conditions very rapidly made themselves felt, and, although we are still able to record an all-round increase of 2.5% in our sales, we are not able to show as rosy a picture as we had at one time hoped. We have also had an unfortunate experience in our investment in the coking plant at Hemsworth. The ovens had been completed in August, and mains that were to receive and distribute the gas were all in position ; arrangements to close down certain of our Companies which were to be served by these mains had been completed. Unfortunately, for reasons that are not yet fully determined, major defects manifested themselves when the ovens were fired. It is proper to point out that the responsibility for the reconstruction of the ovens falls not upon us, but upon the contractors. However, the consequential loss occasioned by the idle capital represented in the mains and the expenses for setting the subsidiary Companies affected to work again has been somewhat heavy ; but the essential soundness of our scheme is more evident than ever, and we are wholly confident of its success when the ovens are reconstructed.

The construction of our West Yorkshire Gas Distribution Company mains was completed in record time. Supplies of gas to the West Yorkshire Gas Distribution Company from sources other than Hemsworth are in process of being made available. This work has been slightly delayed on account of war conditions. Nevertheless, we anticipate we shall be able to meet all the increased demands for gas for munition purposes in the Constituent Companies which are served by the Distribution Company's mains, and this we shall do at the lowest possible cost.

Gas-Propelled Vehicles

We have done a great deal of experimental and development work in connexion with the propulsion of motor vehicles by means of gas under pressure in cylinders. So promising are the results obtained that we have every reason to believe that even under peace conditions wide use can be made of our patents, especially in connexion with heavy transport vehicles.

I am pleased to be able to say that the Gas Industry is performing a most important National function in the production of benzole, and other chemical products, necessary for the prosecution and winning of the war, and in so far as your Corporation is concerned, the energies of the technicians of our Central Administration, and of our subsidiaries, are being exercised to produce the maximum quantities of these essential commodities, to secure maximum efficiencies in manufacture for the purpose of economy in the use of coal, and to provide gas as cheaply as possible for the many munition factories that we have been called upon to supply.

We have recently heard much about the question of coal supplies, and it is inevitable that the war should give rise to many problems affecting supply and distribution. I feel sure that the miners of the country will respond willingly to the demand now made upon them for a great effort to ensure maximum production to meet the heavy demands in the period ahead, and we, on our part, will endeavour to assist the Mines Department and the collieries by organizing our arrangements for receiving and stocking coal as far as practicable to meet those variations in deliveries which are a direct consequence of abnormal war conditions.

I do not intend to take up your time with a long speech, nor to stress the difficulties occasioned by present circumstances. Suffice it to say that Col. Carr and his staff have worked and are working with all their energies, first and primarily to assist in every way in the successful prosecution of the war—and gas undertakings have a big part to play therein—and secondly in the consolidation and strengthening of our Corporation for the ultimate benefit of consumers, shareholders, and employees alike.

I would like here to take the opportunity of stating that we shall accept uncomplainingly whatever further burdens it may be found necessary to lay upon us, and I would venture to urge upon the whole of our Industry to adopt a like attitude. No one to-day is the least interested to hear complaints. We have got to play our important rôle in winning the war, and this great Corporation hereby dedicates itself anew to the task.

The CHAIRMAN then formally moved:

> "That the Report of the Directors, together with the Accounts of the Corporation for the year ended Dec. 31, 1939, as now submitted, be and the same are hereby received, approved, and adopted."

The MANAGING DIRECTOR (Col. W. M. Carr, O.B.E., T.D.), in seconding the resolution, observed that, having regard to the existing conditions, he thought their results compared favourably with those of other gas undertakings throughout the country. It would be idle to deny that times were difficult, but that applied equally to every industry and business in the land. So long as they did not spare themselves in putting every effort into all they were called upon to do, they would be assisting to bring the war to a successful conclusion and the greater would be their chance of benefiting in the future. The subsidiary companies of the Corporation, went on Col. Carr, had been maintained in excellent condition, and with the Corporation's assistance they were, generally speaking, in an improved condition. They had carried out a great deal of reconstruction work and were in a much stronger position than a year ago. Indeed, they had spared no expense in obtaining maximum efficiency. No one could forecast what the results might be in the present circumstances, but the Corporation would play its part with the rest of the Industry which had such a great function to fulfil at the present time.

The resolution for the adoption of the Report and Accounts was then put to the meeting and carried unanimously.

Dividends

The CHAIRMAN thereafter moved:

> "That the payment of the interim dividend on account of the year to Dec. 31, 1939, of 2% (actual), less income-tax at 7s. in the £, on the ordinary shares on Nov. 17, 1939, be and is hereby confirmed.
>
> "That a final dividend of 3% (actual), making 5% for the year to Dec. 31, 1939, less income-tax at the rate of 7s. 6d. in the £, be and is hereby declared payable on June 15, 1940, to those persons who were registered as holders of the shares at the close of business on May 20, 1940."

This resolution was seconded by Mr. A. V. HAMBRO, M.P., D.L., J.P., and unanimously agreed.

Directors and Auditors

On the proposition of the CHAIRMAN, seconded by Mr. M. H. TETLEY, M.I.Mech.E., Capt. H. F. H. Jones, the Director retiring by rotation, was unanimously re-elected to the Board. Col. CARR went on to move that, in view of war conditions, the number of Directors be increased to seven, and that Vice-Admiral Arthur L. Snagge, C.B., be elected to the Board of the Corporation. Vice-Admiral Snagge, said Col. Carr, had during the past year taken a tremendous amount of interest in the work of the Corporation and had greatly assisted him in the conduct of the business of many of their subsidiary companies during the absence of two of their other Directors on war service. This resolution was seconded by Mr. A. V. HAMBRO and unanimously accepted—Vice-Admiral SNAGGE duly acknowledging his election.

On the proposition of Mr. H. C. SHILTEN, seconded by Mr. F. ROBSON, the Corporation's Auditors (Messrs. Deloitte, Plender, Griffiths & Co., Chartered Accountants), were re-appointed until the next Annual General Meeting at a fee to be agreed with the Board of Directors.

This concluded the business of the meeting.

'A & M'
PRESSURE
RECORDERS

These instruments are available in three sizes for 8", 12" and 20" charts, pressure or vacuum, daily or weekly readings.

Beautifully finished they are fitted with glass domes as standard, but locking tinplate cases can be supplied if preferred.

The 8" Daily Model has been approved by the Gas Referees for use in conjunction with recording calorimeters.

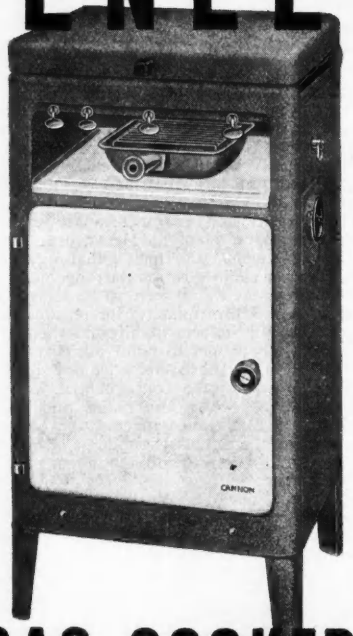
ALDER & MACKAY LTD.

EDINBURGH - LONDON - BRADFORD & BRANCHES

CANNON

Ideal for Re-establishing Long Term Hire Purchase

HENLEY



GAS COOKER

The streamlined Cannon "Henley" cooker has ALL the advantages: Flush-fitting door and "Autimo" oven-heat control, "Porceliron" finish, cast-iron linings with embossed shelf positions, automatic plate rack, and high speed grill.

CANNON IRON FOUNDRIES LTD.,
DEEPFIELDS, Nr. BILSTON, STAFFS.
Telephone: Bilston 41241

Sales of Gas Products

The London Market

June 3.

Prices of tar products in the London market remain unchanged as follows: Pitch about 50s. per ton f.o.b.; creosote, about 4¼d. to 5d. per gallon; refined tar, 3¾d. to 4d. per gallon; the price of pure toluole under the Ministry of Supply order is just under 2s. 5d. per gallon; pure benzole, 1s. 10d.; 95/160 solvent naphtha, 1s. 11d. to 2s., and 90/160 pyridine about 18s. 6d., all per gallon naked; refined naphthalene crystals, £23 per ton in bags, all *ex* makers' works.

The Provinces

June 3.

Crude Gas-Works tar, 27s. 3d. to 32s. 3d.

To avoid misunderstanding, it is necessary to state that the above price is not claimed to represent a market value. It is a price worked out from week to week upon a system which has been used for many years as a basis for the fixing of certain contracts for crude tar of varying qualities in different areas.

The average prices of gas-works products during the week were: Pitch—East Coast, 47s. 6d. to 52s. 6d. f.o.b. West Coast—Manchester, Liverpool, Clyde, 47s. 6d. to 52s. 6d.* Toluole, naked, North, 1s. 9½d. (Controlled by the Ministry of Supply Order No. 1, which fixes the maximum price at which this material may be sold). Coal tar, crude naphtha, in bulk, North, 9d. to 9½d. Solvent naphtha, naked, North, 1s. 8d. to 1s. 9d. Heavy naphtha, North, 1s. 4½d. to 1s. 5½d. Creosote, *ex* works, in bulk, North, liquid and salty, 4½d. to 4¾d.; Scotland, 4¾d. to 4¾d.; low gravity, 4½d. to 4¾d. Fuel Grade, 4d. to 4¼d. Carbolic acid, 60's. 3s. 6d. to 3s. 7½d. Naphthalene, £15 to £20. Salts, 75s. to 85s., bags included. Anthracene, "A" quality, 4½d. to 4¾d. per minimum 40% purely nominal. Heavy oil: Unfiltered anthracene oil, (min. gr. 1,080). 5¼d. to 5½d.; filtered heavy oil (min. gr. 1,080), 5¾d. to 6d.; heavy anthracene oil gr. less than 1,080, 6d. to 6¼d.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls, whatever they may be.

Scotland

GLASGOW, June 1.

Quietly steady conditions have prevailed in this district throughout the week. Prices of most products are steady to firm.

Crude gas-works tar.—The actual value is about 42s. 6d. to 45s. per ton *ex* works in bulk.

Pitch remains in good call with prices firm at about 40s. per ton f.o.b. for export and about 37s. 6d. per ton *ex* works in bulk for home trade.

Refined tar.—Only a small volume of business is being placed with price in the home market unchanged at 4¼d. to 4½d. per gallon, and for export at about 3¾d. to 3½d. per gallon, both f.o.r. naked.

Creosote oil.—Supplies are sufficient to meet demand, but makers' prices are steady as under: Specification oil, 5¼d. to 5¾d. per gallon; low gravity, 6¼d. to 7d. per gallon; neutral oil, 6d. to 6½d. per gallon; all *ex* works in bulk.

Cresylic acid.—The demand for this product is comparatively small, but makers' prices are unchanged as under: Pale, 97/99%, 2s. 1d. to 2s. 2d. per gallon; dark, 97/99%, 1s. 10d. to 1s. 11d. per gallon; pale, 99/100%, 2s. 6d. to 2s. 8d. per gallon; all *ex* works in buyers' packages.

Crude naphtha.—Available supplies readily command 6½d. to 7d. per gallon *ex* works in bulk.

Solvent naphtha.—90/160 grade is 1s. 8½d. to 1s. 9½d. per gallon and 90/190 heavy naphtha is 1s. 4½d. to 1s. 5½d. per gallon.

Motor benzole is 1s. 8d. to 1s. 8½d. per gallon.

Pyridine.—With production well looked after prices are nominal at 18s. to 19s. per gallon for 90/160 grade and 20s. to 21s. per gallon for 90/140 grade.

Company Meetings

Newton Chambers & Co., Ltd.

Proposing the adoption of the report and balance-sheet at the annual general meeting of Newton Chambers & Co., Ltd., the Chairman (Sir Samuel Roberts, Bt.) observed that the gross profit, as compared with the previous year, had increased from £178,000 to £297,000 and the net profit from £117,000 to £126,000. Both these figures were greater than at any time in the history of the Company. The dividend proposed was the maximum that they were allowed to pay, and the net amount received by the shareholders was less than they received last year—so they were in no way benefiting out of the present emergency. The Directors recommended transferring £25,000 to the capital sinking fund reserve, which would thus amount to over £175,000—which sum was being invested outside the business. They took up, on behalf of this fund, £40,000 of the new Government 3% War Loan. The reserve for development expenditure had been kept at £40,000 by transferring the past year's expenditure on development—viz., £3,367—from the trading account.

No expense had been spared by the Company and no effort by the employees to make their A.R.P. measures as complete and efficient as possible. They were writing off all expenditure on A.R.P. during the year in which the work was done. During the year the volume of orders taken by the ironworks was the highest in its history, and in the last seven years the turnover of this department had doubled. In view of the importance of exports, it was gratifying to record that their exports in the chemical department for 1939 were the highest for 10 years, while for the seventh year in succession this department had achieved record sales.

Ruston & Hornsby, Ltd.

Ruston & Hornsby, Ltd., the Lincolnshire engineering firm, are among the growing number of companies which have achieved higher trading profits but show smaller net profits after taxation. For the year ended March 31 gross profits rose by £26,822 to £345,517, but the net profit, struck after providing £70,000 for E.P.T., was down from £301,406 to £258,583. A sum of £30,000 is transferred to reserves for contingencies and £25,000 goes to general reserve, raising this fund to £225,000. After maintaining the ordinary dividend at 12½%, the Board are carrying forward £75,016, against £55,956 brought in.

Trading Results in 1939

British Timken. — Profit, £115,619 (£91,879); 15% (same); tax reserve £55,000 (£30,000); general reserve £23,427 (£25,000); forward £26,310 (£22,868).

British Thermostat. — Profit £63,978 (£31,585); 11%, making 18½ (same).

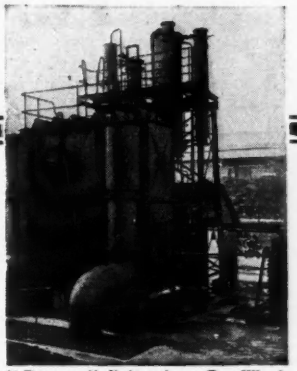
Stream-Line Filters.—Profit, £27,343 £28,755); 7%, making 10% (20%); tax reserve, £10,000 (£6,200); reserves, £5,916 (£4,000); capital includes expenses written off; forward, £4,127 (£4,525).

Turner & Newall.—Interim, 3¼% (same).

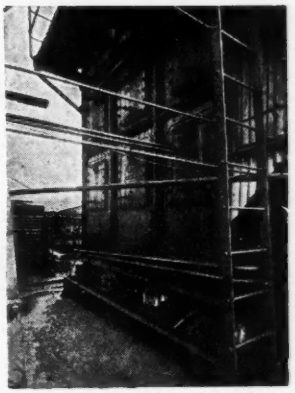
Contract Advertised

Painting Gasholders.

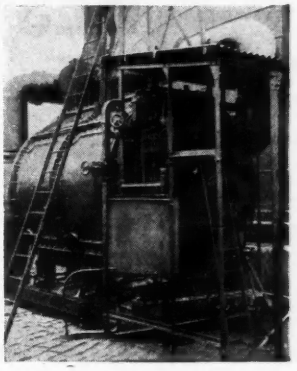
Brighouse Gas Department. [p. 498.]



"Permac" Joints in a Gas Works.



"Permac" Joints in a Gas Works.



"Permac" Joints in a Gas Works.

Permac

METAL-TO-METAL JOINTING MATERIAL

Ever since 1913 "PERMAC," the original Metal-to-Metal Jointing, has been holding up difficult joints like these in important Gas Works and on Coke Oven Plants all over the world. Equally suitable for any joint—steam, water, gas, oil—screw pipe or flange. Send for particulars.

Manufactured only by

Thomas & Bishop LTD.

37, Tabernacle Street, LONDON, E.C.2

Telephone: Clerkenwell 3351 (2 lines)

For every size of works and every class of coal...

WEST'S

CARBONIZING PLANTS

GLOVER-WEST VERTICALS

WESTVERTICAL CHAMBERS

440 carbonizing plants have been built or are under construction by West's in 24 countries. Working results from a wide variety of gas coals have established the high efficiency and adaptability of the West systems.

WEST'S

GAS IMPROVEMENT CO · LTD ·

MILES PLATTING MANCHESTER 10

TELEPHONE—COLLYHURST 2961-2-3-4-5 · TELEGRAMS—STOKER, MANCHESTER

LONDON OFFICE TEMPORARY ADDRESS—BATH ROAD · HARMONDSWORTH · WEST DRAYTON · MIDDLESEX TEL.—WEST DRAYTON 2288-9

GAS STOCKS AND SHARES

Business on the Stock Exchange last week, except in the gilt-edged market, continued on a small scale. Prices in this section reacted on Tuesday on the news of the Belgian surrender, but subsequently recovered and several stocks closed fractionally higher than a week ago—2½% Consols showed no change at 74. The home rail market has been the hardest hit and a number of stocks have recorded heavy falls since the beginning of May. Leading industrials are also distinctly weak, and with investors endeavouring to sell for purchase of gilt-edged stocks dealers have marked down prices severely. Similar conditions also prevailed in the oil, rubber, and mining sections, and in the absence of any support prices show no signs of recovering.

Except in the case of some of the leaders business in the Gas Market was also very quiet and a number of these stocks showed further and heavier reactions. Wandsworth ordinary fell no less than 15 points to 70½ and business was recorded at 69 against the previous transactions at 85½ on May 17. Gas Light units dropped 1s. 6d. to 12s. 6d., South Metropolitan closed 6 points lower at 57½, Tottenham fell 3 to 92½, and a number of fixed-interest stocks also sharply reacted. On the Provincial Exchanges Liverpool closed 2 points lower at 108 and Newcastle preference and debenture issues also weakened. No changes occurred in the Supplementary List.

Supplies of debenture and preference stocks are still very limited, but more ordinary stock is now available, and at the time of writing the following parcels are on offer:—

Amount Offered. £		Dividend Bases. %	Price.	Yield. £ s. d.
210	Barnet	7	127	5 10 3
1,000	Bournemouth	7	121	5 15 8
2,000	British	7½	100	7 10 0
520	Croydon sliding scale	7	102	6 17 3
2,200	„ 5% max.	5	87	5 15 0
500	East Hull	£4/14/3	80	5 17 9
5,000	Gas Light Units	4½	13/-	6 18 6
1,000	Imperial Continental	6	60	10 0 0
1,150	Newcastle Units	£5/1/9	19/-	5 7 0
300	Plymouth and Stonehouse	7	122	5 14 9
1,000	South Metropolitan	4½	60	7 10 0
1,500	South Suburban	4½	78	5 15 4
1,000	United Kingdom	5	15/-	6 13 4
2,500	Wandsworth	5	80	6 5 0

Official Quotations on the London Stock Exchange

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations May 31.	Rise or Fall on Week.
1,767,439	Mch. 11	8	7	Alliance & Dublin Ord. ...	112—117	..
374,000	Dec. 27	4	4	Do. 4 p.c. Deb. ...	80—90	...
957,608	May 13	5	5	Asscd. Gas & Water U'd'ts Ord.	14/—16/-	...
500,000	„	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	15/6—17/6	...
535,545	„	4	4	Do. 4 p.c. Red. Cum. Pref.	14/6—16/6	...
336,646	„	4	4	Do. 4 p.c. Irred. Cum. Pref.	13/—15/-	...
750,000	Mch. 18	3½	3½	Do. 3½ p.c. Red. Deb. ...	82—87	...
560,070	Feb. 19	7	7	Barnet Ord. 7 p.c.	122—127	...
300,000	Apl. 8	1/4⅜	1/9⅜	Bombay, Ltd.	19/6—21/6	...
181,915	Feb. 26	9½	9½	Bournemouth Sliding Scale ...	145—150	...
690,526	„	7	7	Do. 7 p.c. max. ...	118—123	−5
493,960	„	6	6	Do. 6 p.c. Pref. ...	116—121	...
50,000	Dec. 18	3	3	Do. 3 p.c. Deb. ...	70—75	...
362,025	„	4	4	Do. 4 p.c. Deb. ...	95—100	...
335,000	„	5	5	Do. 5 p.c. Deb. ...	105—110	...
357,900	Feb. 19	7½	6¾	Brighton, &c., 6 p.c. Con. ...	103—108	...
659,955	„	6¾	5⅝	Do. 5 p.c. Con. ...	100—105	...
205,500	„	6	6	Do. 6 p.c. 'B' Pref. ...	103—108	...
855,000	Mch. 11	7	8	British Ord.	90—100	...
100,000	Dec. 18	7	7	Do. 7 p.c. Pref.	120—125	...
350,000	„	5½	5½	Do. 5½ p.c. 'B' Cum. Pref.	110—115	...
120,000	„	4	4	Do. 4 p.c. Red. Deb.	77—82	...
450,000	„	5	5	Do. 5 p.c. Red. Deb.	100—105	...
100,000	22 May '33	6	4	Cape Town, Ltd.	½—¾	...
100,000	6 Nov. '33	4½	4½	Do. 4½ p.c. Pref.	½—¾	...
150,000	Dec. 18	4½	4½	Do. 4½ p.c. Deb.	53—58	...
626,860	Jan. 29	6	5⅞	Cardiff Con. Ord.	103—108	...
237,860	Dec. 18	5	5	Do. 5 p.c. Red. Deb. ...	95—100	...
98,936	Apl. 8	2/-	2/-	Colombo Ord.	1½—1¾	...
24,510	„	1/4⅜	1/4⅜	Do. 7 p.c. Pref.	20/—22/-	...
739,453	Mch. 26	-/11.48	-/11.48	Colonial Gas Assn. Ltd. Ord. ...	14/6—16/6	...
296,144	„	1/3.30	1/3.30	Do. 8 p.c. Pref.	20/—22/-	...
1,775,005	Jan. 29	4	2	Commercial Ord.	45—50	...
140,000	Feb. 19	4	4	Do. 4 p.c. Red. Pref. ...	87—92	...
620,000	Dec. 11	3	3	Do. 3 p.c. Deb.	62—67	...
286,344	Feb. 19	5	5	Do. 5 p.c. Deb.	97—102	...
200,000	„	3½	3½	Do. 3½ p.c. Red. Deb. ...	93—98	...
807,560	Feb. 12	7	7	Croydon sliding scale ...	97—102	...
644,590	„	5	5	Do. max. div.	85—90	...
620,385	Dec. 7	5	5	Do. 5 p.c. Deb.	102—107	...
208,660	Feb. 19	5	5	Dudley, Brierley Hill & Dist. Ord.	98—103	...
82,275	„	5	5	Do. 5 p.c. Con. Pref. ...	93—98	...
79,000	„	3½	3½	Do. 3½ p.c. Red. Deb. ...	93—98	...
239,000	Jan. 29	5	88/6	East Hull Ord. 5 p.c. ...	70—80	...
187,215	Feb. 12	5½	5½	East Surrey Ord. 5 p.c. ...	93—98	...
176,211	Dec. 18	5	5	Do. 5 p.c. Deb. ...	100—105	...
250,000	Nov. 13	8	4	Gas Consolidation Ord. 'B' ...	15/—17/-	...
250,000	May 13	4	4	Do. 4 p.c. Red. Cum. Pref.	15/—17/-	...
19,152,410	Jan. 29	5⅜	3⅜	Gas Light & Coke Ord. ...	11/6—13/6a	−1/6
2,600,000	„	3½	3½	Do. 3½ p.c. max.	58—63	−4
4,477,106	„	4	4	Do. 4 p.c. Con. Pref. ...	84—89	−1
2,993,000	Jan. 2	3½	3½	Do. 3½ p.c. Red. Pref. ...	86—91	−1
8,602,497	Nov. 27	3	3	Do. 3 p.c. Con. Deb. ...	71—76	...
3,642,770	„	5	5	Do. 5 p.c. Red. Deb. ...	102—107	−1
3,500,000	„	4½	4½	Do. 4½ p.c. Red. Deb. ...	100—105	...
700,000	Mch. 11	3½	3½	Do. 3½ p.c. Red. Ded. ...	87—92	...
270,466	Feb. 19	6	6	Harrogate New Cons.	93—98	...
157,500	Apl. 8	‡1/-	‡1/-	Hong Kong and China Ord. ...	⅛—⅜	...
5,600,000	May 13	4	8	Imperial Continental Cap. ...	47—57	...
172,810	Jan. 29	3½	3½	Do. 3½ p.c. Red. Deb. ...	75—80	−5
63,480	Dec. 18	3	3	Maidstone 3 p.c. Deb.	55—60	...
45,000		†10	†8	Malta & Mediterranean ...	92—102	...
				Metropolitan (of Melbourne) ...		
392,000	Apl. 1	5½	5½	5½ p.c. Red. Deb.	95—100	...
231,977	Feb. 19	5	5	M.S. Utility 'C' Cons.	77—82	−1
968,658	„	4	4	Do. 4 p.c. Cons. Pref. ...	83—88	...
390,076	Dec. 18	4	4	Do. 4 p.c. Deb. ...	87—92	...
148,955	Dec. 18	5	5	M.S. Utility 5 p.c. Deb. ...	103—108	...
125,000	Jan. 2	3½	3½	Do. 3½ p.c. Red. Bds. ...	90—95	...
675,000	May 6	†4	†4	Montevideo, Ltd.	58—63	...
250,000	Mch. 18	7½	5⅞	North Middlesex 6 p.c. Con. ...	103—108	..
396,160	Jan. 29	5	5	Northampton 5 p.c. max. ...	97—102	...
300,000	Apl. 29	9	7	Oriental, Ltd.	113—118	...
468,537	Dec. 11	8	7	Plymouth & Stonehouse 5 p.c.	118—123	...
621,667	Feb. 5	8½	8½	Portsmouth & Gosport Cons.	110—115	...
241,446	„	5	5	Do. 5 p.c. max.	85—90	...
73,350	„	5	5	Do. 5 p.c. Pref.	90—95	...
75,000	„	4	4	Do. 4 p.c. Pref.	75—80	...
114,000	Feb. 5	5	5	Preston 5 p.c. Pref.	88—93	...
247,966	Dec. 18	4	4	Primitiva 4 p.c. Cons. Deb. ...	93—98	...
625,959	Jan. 15	4	4	Do. 4 p.c. Red. Deb. ...	91—96	...
15,000	Mch. 11	6	6	San Paulo 6 p.c. Cum. Pref. ...	7½—8½	...
441,275	Apl. 29	1/1½	1/1½	Severn Val. Gas Cor. Ld. Ord.	16/6—18/6	...
460,810	Mch. 11	-/10⅝	-/10⅝	„ „ 4½ p.c. Cum. Pref. ...	16/6—18/6	...
133,201	Feb. 12	8½	5	Shrewsbury 5 p.c. Ord. ...	105—115	...
9,000	June 5	‡4	‡4	South African Ord.	4—5	..
1,996,297	Apl. 29	1/2⅜	1/	South East'n Gas Cn. Ld. Ord.	13/—15/-	...
1,000,000	Mch. 4	-/10⅜	-/10⅜	Do. 4½ p.c. Red. Cum. Pref.	15/6—17/6	−1/-
769,191	„	4	4	Do. 4 p.c. Cum. Pref. ...	14/—16/-	−1/-
450,000	Feb. 12	4	4	Do. 4 p.c. Red. Deb. ...	95-100	...
150,000	„	3½	3½	Do. 3½ p.c. Red. Deb. ...	89—94	...
6,709,895	„	5	4	South Met. Ord.	55—60	−6
1,135,812	„	6	6	Do. 6 p.c. Irred. Pref. ...	109—114	−1
850,000	„	4	4	Do. 4 p.c. Irred. Pref. ...	82—87	−1
1,895,445	Dec. 27	3	3	Do. 3 p.c. Deb.	72—77	...
1,000,000	Jan. 15	5	5	Do. 5 p.c. Red. Deb. ...	102—107	..
600,000	„	3¾	3¾	Do. 3¾ p.c. Red. Deb. ...	92—97	...
1,543,795	Feb. 5	6	3	South Suburban Ord. 5 p.c. ...	75—80	−2
512,925	„	5	5	Do. 5 p.c. Pref.	93—98	..
500,000	„	4	4	Do. 4 p.c. Pref.	82—87	..
250,000	„	3¾	3¾	Do. 3¾ p.c. Red. Pref. ...	85—90	−5
888,587	Dec. 11	5	5	Do. 5 p.c. Deb.	100—105	−4
250,000	„	4	4	Do. 4 p.c. Deb.	87—92	...
200,000	Feb. 12	3½	3½	Do. 3½ p.c. Red. Deb. ...	87—92	...
427,859	Apl. 15	-/9⅜	1/2⅜	S. Western Gas & Water Ord.	13/—15/-	...
160,523	„	-/10⅜	-/10⅜	Do. 4½ p.c. Red. Cum. Pref.	16/6—18/6	...
110,000	Dec. 18	4	4	Do. 4 p.c. Red. Deb. ...	90—95	...
750,541	Feb. 5	5	5½	Southampton Ord. 5 p.c. ...	75—80	...
148,836	Dec. 27	4	4	Do. 4 p.c. Con.	87—92	...
350,000	Feb. 12	5½	5½	Swansea 5½ p.c. Red. Pref. ...	97—102	...
200,000	Dec. 18	3½	3½	Do. 3½ p.c. Red. Deb. ...	90—100	...
1,076,490	Feb. 26	6½	5	Tottenham and District Ord....	90—95	−3
409,835	„	5½	5½	Do. 5½ p.c. Pref.	102—107	...
62,235	„	5	5	Do. 5 p.c. Pref.	95—100	...
453,380	Dec. 11	4	4	Do. 4 p.c. Deb.	87—92	...
1,247,505	May 20	4	6	U. Kingdom Gas Cor. Ord. ..	13/6—15/6	...
1,085,952	May 13	4½	4½	Do. 4½ p.c. 1st Cum. Pref. ...	14/6—16/6	...
772,709	„	4	4	Do. 4 p.c. 1st Red. Cum. Pf.	14/—16/-	...
745,263	Dec. 18	4½	4½	Do. 4½ p.c. 2nd Non-Cum. Pf.	13/—15/-	...
1,093,656	Mch. 18	3½	3½	Do. 3½ p.c. Red. Deb. ...	83—88	...
378,106	Mch. 11	7	7	Uxbridge, &c., 5 p.c.	95—100	...
133,010	„	5	5	Do. 5 p.c. Pref. ...	95—100	..
1,371,138	Feb. 5	6½	3½	Wandsworth Consolidated ...	68—73	−15
2,525,768	„	4	4	Do. 4 p.c. Pref.	80—85	−2
1,343,964	Dec. 18	5	5	Do. 5 p.c. Deb.	100—105	−6
383,745	„	4	4	Do. 4 p.c. Deb.	87—92	...
400,000	„	3¾	3¾	Do. 3¾ p.c. Red. Deb. ...	90—95	...
558,342	Jan. 29	6¾	6	Watford and St. Albans Ord. ...	95—100	...
200,000	„	5	5	Do. 5 p.c. Pref.	95—100	...
200,000	„	5½	5½	Do. 5½ p.c. Pref.	100—105	...
200,000	„	4	4	Do. 4 p.c. Rd. Pf. (1973/8)	85—90	...
100,000	„	33/4⅝	4	Do. 4 p.c. Red. Pf. (1959)	93—98	...
200,000	Dec. 11	3½	3½	Do. 3½ p.c. Red. Deb. ...	87—92	...

a.—The quotation is per £1 of Stock. * Ex. Div. † Paid free of income-tax. ‡ For year. § Actual.

Supplementary List and Provincial Exchanges overleaf.

STOCK AND SHARE LIST—Contd.

Supplementary List, not Officially Quoted, London

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Nominal Quotations May 31.	Rise or Fall on Week
202,152	Mch. 18	5	5	Ascot Ord.	80—85	...
128,182	Dec. 27	5	5	Do. 5 p.c. Pref. ...	88—93	...
31,035	Mch. 4	-/9 3/8	-/9 3/8	Associated Utilities 4 p.c. Pref.	15/—17/-	...
100,000	Dec. 18	3½	3½	Do. 3½ p.c. Red. Deb. ...	90—95	...
17,000	Feb. 19	8	8	Bognor Orig. Ord. 'A' ...	102—112	...
62,210	„	8	8	Do. New Add. 'A' ...	102—112	...
87,160	„	7	7	Do. New 7 p.c. max. ...	95—105	...
37,440	Jan. 29	10	10	Cam. Univ. & Town 10 p.c. max.	145—155	...
125,970	„	7	7	Do. 7 p.c. max.	110—120	...
39,025	„	5	5	Do. 5 p.c. max.	80—90	...
96,410	Jan. 29	4½	4½	Cardiff 4½ p.c. Pref.	90—95	...
55,520	Feb. 19	6	6	Colchester 6 p.c. Pref.	100—105	...
90,550	Mch. 18	5	5	Do. 5 p.c. Deb. ...	98—103	...
150,000	Feb. 12	4	4	Croydon 4 p.c. Pref.	82—87	...
130,000	Dec. 27	4	4	Do. 4 p.c. Deb.	87—92	...
65,000	Mch. 4	7½	6 7/8	Eastbourne 'A' 5 p.c.	105—110	...
198,000	„	6	5 3/8	Do. 'B' 3½ p.c.	93—98	...
112,312	„	5	5	Do. 5 p.c. Pref.	90—95	...
130,000	Dec. 18	5	5	Do. 5 p.c. Deb.	98—103	...
130,500	Feb. 19	7½	7½	Exeter New Ord. (£10) ...	12—14	...
24,000	Aug. 21	8½	8½	Gt. Yarmouth 8½ p.c. max. (£30)	15—20	...
59,400	„	7½	7½	Do. 7½ p.c. max. (£30) ...	10—15	...
51,160	Dec. 11	5½	5½	Do. 5½ p.c. Deb.	102—107	...
152,600	Feb. 26	8	9	Guildford Cons.	110—120	...
54,055	„	5	5	Do. 5 p.c. Pref.	90—95	...
68,250	Dec. 11	5	5	Do. 5 p.c. Deb.	90—95	...
156,600	Feb. 19	7	5	Hampton Court Cons. ...	75—85	...
86,046	June 19	‡4½	‡5	Holyh'd&N.W.G.&W.Cpn.Ord.	13/6—15/6	...
80,000	Feb. 12	4	4	Lea Bridge 4 p.c. Pref.	75—80	...
60,000	„	6	6	Do. 6 p.c. Pref.	105—115	...
94,876	Dec. 18	4	4	Do. 4 p.c. Deb.	88—93	...
73,620	Mch. 18	8½	8½	Luton Cons. 'A'	115—125	...
107,960	Feb. 26	4	5½	Mid Kent Ord. (£10)	7½—8½	...
230,940	Feb. 5	10	10	Oxford & District Ord. ...	135—145	...
47,112	„	5	5	Do. 5 p.c. Pref.	85—90	...
50,000	„	6	6	Do. 6 p.c. Red. Pref. ...	100—105	...
126,193	May 13	7½	7½	Peterborough Ord.	138—148	...
64,990	Mch. 18	7	7	Redditch Ord.	100—110	...
166,850	Feb. 19	8	8	Romford Ord.	108—118	...
60,000	„	4	4	Do. 4 p.c. Pref.	85—90	...
44,000	Mch. 18	5	5	Do. 5 p.c. Deb.	97—102	...
25,570	Feb. 12	5¼	5¼	Rugby 5¼ p.c. Pref.	100—110	...
25,000	„	6	6	Do. 6 p.c. Red. Pref. ...	100—105	...
42,750	De. 11	5¼	5¼	Do. 5¼ p.c. Deb.	105—110	...
110,950	Feb. 26	8	8	Ryde Ord.	100—110	...
270,086	Mch. 18	7	7	Slough Ord.	98—103	...
21,000	Dec. 11	5	5	Do. 5 p.c. Deb.	98—103	...
28,872	May 13	5½	5½	S. Midland Gas Cpn. Ltd. Ord.	14/—16/-	...
28,866	Mch. 18	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	14/—16/-	...
127,228	Feb. 19	5	7	Swindon Cons.	75—80	...
60,425	Dec. 18	5	5	Do. 5 p.c. Deb.	95—100	...
64,380	„	5	5	Torquay & Paignton 5 p.c. Pref.	85—90	...
130,000	Feb. 12	5	5	Wakefield Ord	85—95	...
81,650	„	5	5	Do. 5 p.c. max	75—80	...
82,000	Jan. 29	6	6	Weymouth Ord.	82—87	...
273,626	Feb. 12	7	7	Wolverhampton Cons. Ord. ...	115—120	...
98,384	„	6	6	Do. 6 p.c. Pref.	105—115	...
160,000	Dec. 18	5½	5½	Do. 5½ p.c. Red. Deb. ...	100—105	...
106,490	Mch. 18	5½	5½	Wrexham Ord	75—85	...
90,000	Dec. 18	5	5	York 5 p.c. Red. Deb.	95—100	...
133,640	Feb. 19	6	6	Yorktown (Cam.) 5 p.c. Cons.	82—87	...
120,000	„	5	5	Do. 5 p.c. Pref.	85—90	...
35,000	Dec. 18	5½	5½	Do. 5½ p.c. Deb.	105—110	...

BRISTOL EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations May 31.	Rise or Fall on Week.
347,756	Feb. 1	5	6	Bath Cons.	105—107	...
1,667,250	Feb.	5	5	Bristol, 5 p.c. max.	102—104	...
120,420	Dec.	4	4	Do. 1st 4 p.c. Deb.	98—101	...
415,250	„	4	4	Do. 2nd 4 p.c. Deb. ...	98—101	...
328,790	„	5	5	Do. 5 p.c. Deb.	115—117	...
274,000	Feb. 26	5	5	Newport (Mon.) Ord.	91—94	...
13,200	Mch. 26	7	8⅛	Pontyp'l Gas & W. 10 p.c. 'A'	11¼—12½	...
13,600	„	5	6	Do. 7 p.c. 'B'	10—11	...
40,000	„	5	6	Do. 7 p.c. 'C'	10—11	...
140,778	Feb. 12	5	5	Weston-super-Mare Cons. ...	92—96	...
64,338	Dec. 27	4	4	Do. 4 p.c. Deb.	90—95	...
33,340	„	7½	7½	Do. 7½ p.c. Deb.	140—150	...

LIVERPOOL EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations May 31.	Rise or Fall on Week.
157,150	Feb. 5	5	6½	Chester 5 p.c. Ord.	98—101	...
92,500	Dec. 18	4	4	Do. 4 p.c. Pref.	84—88	...
36,430	„	3½	3½	Do. 3½ p.c. Deb.	85—88	...
41,890	„	4	4	Do. 4 p.c. Red. Deb. ...	95—99	...
2,167,410	Feb. 19	6	6	Liverpool 5 p.c. Ord.	107—109	- 2
245,500	Dec. 18	5	5	Do. 5 p.c. Red Pref. ...	99¼—102½	...
306,083	July 17	4	4	Do. 4 p.c. Deb.	98—101	...
106,280	Feb. 5	10	8	Preston 'A' 10 p.c.	160—170	...
188,219	„	7	7	Do. 'B' 7 p.c.	115—125	...

NEWCASTLE EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations May 31.	Rise or Fall on Week.
122,577	Feb. 19	7	7	Blyth 5 p.c. Ord.	113—118	...
732,000	Feb. 19	4	4	Hartlepool G. & W. Co. & New	65—67	...
2,430,267	Feb. 5	5	5 7/10	Newcastle & Gateshead Con.	18/6—19/-a	...
682,856	„	4	4	Do. 4 p.c. Pref.	85—87	- 5
776,706	Dec. 27	3½	3½	Do. 3½ p.c. Deb.	82—87	- ½
277,285	April 24	5	5	Do. 5 p.c. Deb. '43 ...	97—102	- 1½
332,351	Feb. 5	6	6	Sunderland 6 p.c. max. ...	111—113	...

NOTTINGHAM EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations May 31.	Rise or Fall on Week.
542,270	Feb. 12	6	9	Derby Con.	103—108	...
55,000	Dec. 18	4	4	Do. 4 p.c. Deb.	93—103	...
20,000	Dec. 18	5	5	Long Eaton 5 p.c. Pref. ...	9—11	...
80,000	„	5	5	Do. 5 p.c. Deb. ...	100—105	...

SHEFFIELD EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations May 31.	Rise or Fall on Week.
10,000	Feb. 19	10	10	Great Grimsby 'A' Ord. ...	170—180	...
6,500	„	10	10	Do. 'B' Ord. ...	170—180	...
79,000	„	10	10	Do. 'C' Ord. ...	160—170	...
1,806,339	Feb. 26	6½	6½	Sheffield Cons.	125—127	...
95,000	Jan. 2	4	4	Do. 4 p.c. Deb.	98—100	...

a The quotation is per £1 of Stock.
* Ex. div. ‡ For year.

THIS WEEK'S ADVERTISERS

	PAGE
A.C.E. Machinery, Ltd.	462
Alder and Mackay, Ltd.	490
Bale & Church, Ltd.	497
Blakeley, Firth, Sons, & Co., Ltd.	497
Bratt Colbran, Ltd.	465
Cellactite & British Uralite, Ltd.	470
Cowan, W. & B.	Cover III
Cutler, Samuel, & Sons, Ltd.	496
Dempster, Robert, & Sons, Ltd. ...	...480, 497
Dick, R. & J., Ltd.	Cover II
Donkin Co., Ltd. (The Bryan) ...	Cover II
Ellison Insulations Ltd.	498
Ether Ltd.	464
Evans, Joseph, & Sons (Wolverhampton), Ltd.	462
Ewart & Son, Ltd.	Cover I
Expanded Metal Co., Ltd.	464
Fluxite, Ltd.	497
Frost, A. E.	497
Gas Meter Co., Ltd.	466
Gas Purification and Chemical Co., Ltd. ...	497
Glenboig Union Fireclay Co., Ltd.	467
Glover, George, & Co., Ltd.	457
Glover, Thos., & Co., Ltd.	474
Goodall, Clayton, & Co., Ltd.	Cover IV
Green & Boulding, Ltd.	497
Hamilton, Archd. H., & Co., Ltd.	460
Holmes, W. C., & Co., Ltd.	499
Horseley Bridge and Thos. Piggott, Ltd. ...	466
Horstmann Gear Co., Ltd.	469
Humphreys & Glasgow, Ltd.	472
Jeavons, E. E., & Co., Ltd.	...468, 497
Keay, E. C. & J., Ltd.	500
Keith Blackman, Ltd.	500
Kleenoff Co.	497
Main, R. & A., Ltd.	486
Menno Compressed Air Greasecup Co., Ltd. ...	497
Ministry of Supply	471
Mitchell, H., & Co.	467
Mobberley & Perry, Ltd.	495
Newton Chambers & Co., Ltd.	483
Oughtibridge Silica Firebrick Co.	460
Parkinson, W., & Co.	474
Peckett & Sons, Ltd.	498
Pulsometer Engineering Co., Ltd. ...	Cover IV
Radiation, Ltd.	...484, 485
Reavell & Co., Ltd.	460
Smith Meters, Ltd.	461
Sperryn & Co.	473
Stein, John G., & Co., Ltd.	469
Strachan & Henshaw, Ltd.	457
Sugg, Wm., & Co., Ltd.	459
Terry, H. & Sons	467
Thomas & Bishop, Ltd.	491
Trotter, Haines, & Corbett, Ltd.	497
Walker, C. & W., Ltd.	496
Waller, Geo. & Son, Ltd.	458
Walworth, Ltd.	463
West's Gas Improvement Co., Ltd.	492
West's Piling and Construction Co., Ltd.	Cover IV
Wilkes, A. H., & Co.	467
Woodall-Duckham Co., Ltd.	479
Appointments Vacant and Wanted	498
Company Notices	498
Contracts Open	498
Patents	497
Plant, &c.	497
Plants, &c., Wanted and for Sale	498